REMARKS

The enclosed is responsive to the Office Action mailed on June 25, 2007. At the time the Office Action was mailed claims 9-14, 18-21, and 56-58 were pending. By way of the present response Applicant has: 1) amended claims 9, 18, and 56; 2) added claims 59-67; and 3) canceled no claims. As such, claims 9-14, 18-21, and 56-67 are now pending. Applicants respectfully request reconsideration of the present application and the allowance of all claims now presented. Applicants respectfully submit that no new matter has been introduced by the included amendments.

Claim Rejections Under 35 U.S.C. §103

Claims 9-14, 18-21 and 56-58 have been rejected under 35 U.S.C. §103(a) as being anticipated by Hama U.S. Patent Publication No. 2004/0202171 in view of Ma et al., U.S. Patent Number 6,954,463 (hereinafter "Ma").

Applicant does not admit that Hama is prior art and reserves the right to swear behind the reference at a later date. Nonetheless, Applicants respectfully submits that Hama in view of Ma does not teach or suggest all the elements of claims 9-14, 18-21 and 56-58.

Claims 9 and 59

Applicant respectfully submits that the proposed combination of Hama and Ma does not describe the required limitations in amended claim 9 and new claim 59.

Amended claim 9 requires (emphasis added):

>Maintaining, for network layer switched routes, interface structures each storing a set of network layer information;
>
>distributing each of the interface structures to a set of one or more of a plurality of routing protocol modules;
>
>maintaining a routing information base responsive to the plurality of routing protocol modules;
>
>distributing <u>forwarding information bases including network layer information</u> to each of a plurality of line cards;
>
>maintaining for each label switched path (LSP) a <u>forwarding data structure</u> that is separate from the interface structures and that <u>does not include the set of network layer information</u>; and
>
>selectively distributing different ones of the forwarding data structures to different ones of the plurality of line cards <u>to establish label forwarding information bases devoid of network layer information,</u> said selectively distributing being done and said label forwarding information bases being created apart from <u>distributing to the plurality of routing protocol modules and the routing information base a subset of the forwarding data structures</u>, wherein the selective distribution of a particular forwarding data structure to a particular line card is based on an ingress and an egress line card associated with the LSP represented by the particular forwarding data structure.

Thus, amended claim 9 requires at least a <u>forwarding information base (FIB) that includes network layer information</u> being distributed to a plurality of line cards, a <u>label forwarding information base (LFIB) devoid of network layer information</u> that is selectively distributed to line cards, where the LFIB is apart from <u>distributing a subset of the forwarding data structures to a plurality of routing protocol modules and the routing information base</u> (see amended claim 9).

Hama describes establishing a virtual private network (VPN) where the core network for the VPN is a multi-protocol label switched (MPLS) network and networks for accessing the core network are virtual local area networks (VLANs) (Hama, Abstract). Hama's edge router straddles the MPLS and VLAN networks

(Hama, Figure 1), with the each edge router comprising one or more separate subrouters and line cards (Hama, Figure 2, paragraph 0072-0073). There is a subrouter for each VPN the edge router participates in (Hama, Figure 5, paragraph 0075). Each subrouter converts the VLAN VPN traffic to MPLS VPN traffic and visa versa using the subrouter's own VPN forwarding table and the edge router's common MPLS Label Switch Path (LSP) network forwarding table (Hama, Figure 2, paragraphs 0074). The subrouter takes incoming VLAN VPN traffic and converts the VLAN VPN traffic to the appropriate MPLS LSP by swapping the VLAN tag with the LSP label (Hama, Figure 9, paragraph 0087). The subrouter converts the MPLS VPN traffic to VLAN VPN traffic in the reverse fashion (Hama, Figure 9, paragraph 0088). The subrouter then forwards the MPLS traffic out the appropriate line card (Hama, paragraph 0074). The line cards transmit and receive packets and relay the packets to and from the sub-router for the processing described above (Hama, paragraph 0072). Furthermore, Hama describes sharing VPN routing information between different edge routers (Hama, Figure 16, 405, paragraph 0109).

Ma describes distributing packets among the line cards, such that each line card is responsible for forwarding and packet processing for packets associated with the ingress ports that line card serves. (Ma, col. 3, lines 30-35). Ma describes a Forwarding Information Base on each line card that is used in the forwarding of the IP packets. As an example of how Ma accomplishes the above, Ma describes an IP packet received at an ingress port on the same line card as a forwarding engine. The forwarding code searches "its local FIB table

for a route entry match corresponding to the packet's destination IP address".

"When forwarding engine successfully locates a FIB entry, the packet is processed". (Ma, col. 10 lines 66-67 through col. 11 lines 1-35). Ma also utilizes, "a master forwarding information base (FIB) and adjacency table for all sessions being handled by the NAS. Portions of these data structures are shared with XPIF and with each line card to enable packet distribution and forwarding..." (Ma, col. 10, lines 21-25). Ma does not describe a label forwarding information base devoid of network layer information existing on the line cards.

The proposed combination of Hama and Ma would have the subrouter system of processing MPLS traffic combined with Ma's IP packet forwarding and packet processing distribution between the line cards. However, as previously described, Ma's distributing packet processing to the line cards is accomplished, in part, by using forwarding information bases on each line card, the forwarding information bases containing network layer information (the FIBs in Ma are being used for IP packet processing). Therefore, the proposed combination does not describe a label forwarding information base devoid of network layer information being distributed to line cards. Additionally, the proposed combination does not describe apart from the label forwarding information base, "distributing to the" "plurality of routing protocol modules and the routing information base a subset of the forwarding data structure" where the forwarding data structures are devoid of network layer information as required by amended claim 9.

By utilizing a forwarding structure devoid of network layer information, Applicant's claimed invention "provides substantial memory savings and enables

the support of relatively large numbers of LSPs without reducing performance of the network element (Specification, paragraph 0025). Also, representing an LSP with the forwarding structure instead of an interface "reduces the amount of data communicated across from the control plane to the data plane" (Specification, paragraph 0035). In addition, representing LSPs with such relatively inexpensive structures reduces the amount of resources consumed when downloading LSP information to the control cards of a network element." (Specification, paragraph 0025). Furthermore, "resources are further conserved because forwarding structures are not propagated to all routing protocol modules, the routing information base, and all forwarding information bases" (Specification, paragraph, 0035).

Therefore, Applicant respectfully submits that the combination of Hama and Ma does not describe the required limitations of amended claim 9. Furthermore, claims 10-14 depend upon claim 9 and are allowable for at least the same reasons.

In addition, new claim 59 is a machine-readable medium version of amended claim 9 and is allowable for at least the same reasons. Furthermore, claims 60-64 depend upon claim 59 and are allowable for at least the same reasons.

Claim 18 (as amended)

Applicant respectfully submits that the proposed combination of Hama and Ma does not describe the required limitations in amended claim 18.

Amended claim 18 requires (emphasis added):

> a plurality of line cards;
> a control card having stored therein,
> > a plurality of interface structures having stored therein
> network layer information;
> > a plurality of routing protocol modules coupled to one or
> more of the plurality of interface structures;
> > a routing information base coupled to said plurality of routing
> protocol modules;
> > a plurality of forwarding data structures <u>devoid of network
> layer information</u> separate from the interface data structures, the plurality
> of forwarding data structures each having stored therein information to
> determine forwarding of packets from an ingress one of said plurality of
> line cards to an egress one of said plurality of line cards, wherein a set of
> one or more of said plurality of forwarding data structures include data
> indicating that they represent a label switched path;
> > a label manager to selectively distribute different ones of the
> forwarding data structures to different ones of the plurality of line cards
> <u>and to selectively distribute a subset of the plurality of forwarding data
> structures to the plurality of routing protocol modules</u>, wherein the
> selective distribution of a particular forwarding data structure to a
> particular line card is based on an ingress and an egress line card
> associated with the label switched path represented by the particular
> forwarding data structure;
> > a first of said plurality of line cards having stored therein,
> > a label forwarding information base generated from at least
> certain of said plurality of forwarding data structures indicating that they
> represent label switched paths<u>, the label forwarding information base
> being devoid of network layer information</u>; and
> > a network layer forwarding information base generated from
> said routing information base.

As previously described above, the proposed combination of Hama and

Ma would have the subrouter system of processing MPLS traffic combined with

Ma's IP packet forwarding and packet processing distribution between the line

cards. However, as previously described, Ma's distributing packet processing to

the line cards is accomplished, in part, by using forwarding information bases on

each line card, the forwarding information bases containing network layer

information (the FIBs in Ma are being used for IP packet processing). Therefore,

the proposed combination does not describe a <u>label forwarding information base</u>

<u>devoid of network layer information on a line card</u>. Additionally, the proposed

combination does not describe a label manager to selectively distribute

forwarding data structures (the forwarding data structures devoid of network layer

information) to line cards and the label manager to selectively distribute a <u>subset</u>

<u>of the plurality of forwarding data structures to the plurality of routing protocol</u>

<u>modules</u> as required by amended claim 18.

By utilizing a forwarding structure devoid of network layer information,

Applicant's claimed invention "provides substantial memory savings and enables

the support of relatively large numbers of LSPs without reducing performance of

the network element (Specification, paragraph 0025). Also, representing an LSP

with the forwarding structure instead of an interface "reduces the amount of data

communicated across from the control plane to the data plane" (Specification,

paragraph 0035). In addition, representing LSPs with such relatively inexpensive

structures reduces the amount of resources consumed when downloading LSP

information to the control cards of a network element." (Specification, paragraph

0025). Furthermore, "resources are further conserved because forwarding

structures are not propagated to all routing protocol modules, the routing

information base, and all forwarding information bases" (Specification,

paragraph, 0035).

Therefore, Applicant respectfully submits that the combination of Hama

and Ma does not describe the required limitations of amended claim 18. In

addition, claims 19-21 depend upon claim 18 and are allowable for at least the same reasons.

Claims 56 and 65

Applicant respectfully submits that the proposed combination of Hama and Ma does not describe the required limitations in amended claim 56 and new claim 65.

Amended claim 56 requires (emphasis added):

> maintaining in a control plane a first data structure that represents a label switched path (LSP), the first data structure indicating a virtual port, a virtual slot, and an identifier to distinguish LSPs of the virtual port and the virtual slot;
> maintaining in the control plane a second data structure indicating the first data structure, a slot, encapsulation information, and an index for the slot and the encapsulation information;
> selectively distributing the first data structure, the index, and an egress to certain of a set of one or more label forwarding information bases (LFIBS) in a data plane, the LFIBS being devoid of network layer information, and selectively distributing the first data structure, the index, and the egress to one or more routing protocol modules in the control plane, wherein the selective distribution to the LFIBS is based on an ingress and an egress line card associated with the LSP;
>
> distributing the index and the encapsulation information to certain of a set of data structures within the data plane.

As previously described above, the proposed combination of Hama and Ma would have the subrouter system of processing MPLS traffic combined with Ma's IP packet forwarding and packet processing distribution between the line cards. However, as previously described, Ma's distributing packet processing to the line cards is accomplished, in part, by using forwarding information bases on

each line card, the forwarding information bases containing network layer information (the FIBs in Ma are being used for IP packet processing). Therefore, the proposed combination does not describe a <u>label forwarding information base (LFIB) being devoid of network layer information in a data plane</u>. Additionally, the proposed combination does not describe "<u>selectively distributing</u>" a "<u>first data structure that represents a label switched path</u>", "the index, and an egress to certain of a set of one or more <u>label forwarding information bases (LFIBS)</u> in a <u>data plane</u>" and "selectively distributing the <u>first data structure</u>, the index, and the egress to <u>one or more routing protocol modules in the control plane</u>" as required by amended claim 56.

By utilizing a forwarding structure devoid of network layer information, Applicant's claimed invention "provides substantial memory savings and enables the support of relatively large numbers of LSPs without reducing performance of the network element (Specification, paragraph 0025). Also, representing an LSP with the forwarding structure instead of an interface "reduces the amount of data communicated across from the control plane to the data plane" (Specification, paragraph 0035). In addition, representing LSPs with such relatively inexpensive structures reduces the amount of resources consumed when downloading LSP information to the control cards of a network element." (Specification, paragraph 0025). Furthermore, "resources are further conserved because forwarding structures are not propagated to all routing protocol modules, the routing information base, and all forwarding information bases" (Specification, paragraph, 0035).

Therefore, Applicant respectfully submits that the combination of Hama and Ma does not describe the required limitations of amended claim 56. In addition, claims 57-58 depend upon claim 56 and are allowable for at least the same reasons.

In addition, new claim 65 is a method version amended claim 56 and is allowable for at least the same reasons. Furthermore, claims 66-67 depend upon claim 65 and are allowable for at least the same reasons.

For at least these reasons, Applicant respectfully submits that the independent claims are allowable. Applicant respectfully submits that the dependant claims are allowable for at least the reason that they are dependent on an allowable independent claim.

Invitation for a telephone interview

The Examiner is invited to call the undersigned at 408-720-8300 if there remains any issue with allowance of this case.
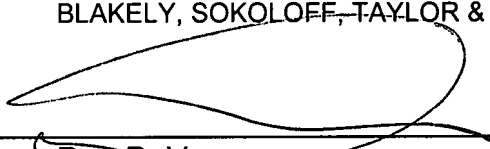
Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: _____9/25____, 2007 _____

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